# TMF

June 1991

THE MAC FLYER - For Greater Safety in MAC Air Operations

The C-12 Story . . . page 16

# TMF

## THE MAC FLYER—For Greater Safety in MAC Air Operations

June 1991 MACSP 127-5 VOL XXXVIII NO. 6

page 16

page 25


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## FEATURES


3 **Flying Into the Proverbial Ink Bottle**
One thing leads to another. . .

6 **Are You Your Brother's Keeper?**
We're all responsible for each other.

12 **Pilots' Sunglasses: Mystique or Mandate?**
Cosmetic value only?

16 **The C-12 and TVT**
Not just OSA missions.

19 **Vacation Time Trouble**
Plan ahead.

21 **Stress and the Pilot**
Getting to know yourself and how to react to stress.

25 **C. R. Terror**
The Aviant Aviator leads the flock.


## DEPARTMENTS


9 **Mishap With A Moral**
15 **Flying-Hour Milestones**
28 **Quickstoppers**
31 **After Deadlines**

# *Flying Into the Proverbial Inkbottle*

By Lt. Col. J. Norman Komich
9001 ARS, Denver CO

Our flight was intended to be a typical night training sortie for an HH-3E. We were supposed to take off before dusk and fly transition until "really dark," head for a night aerial refueling, then terminate (no pun intended, as we shall see).

My duty day began early and, although I was within the legal time limit, there was not a lot of room to spare. I put in a full day of shuffling papers and ran out to complete a couple of errands, intending to stop en route and grab something to eat at the flight line deli. However, the best laid plans .... Traffic and long lines delayed me and I had no time to eat. I always kept a can of V- 8 and granola bars in my locker for such contingencies, so I consumed those during the briefing. However, they didn't do a very good job of filling the void in my stomach that had begun with my "Cup-a-soup" lunch.

I was the aircraft commander for this mission and was flying with another recently upgraded AC. Since I was IP-qualified and had not had much time "on the hose" from the left seat recently, I chose to fly there. The other two crewmembers had also put in a full day prior to the flight.

Since the tanker crew was briefing at a different time, we intended to brief the AR over the radio. Our takeoff and initial transition went as planned though, I now realize, the lack of stimulation in that phase of flight set the scene for what was to come. I had flown the SAR mission in SEA and had made two trans-pacific flights in an HH-53. Consequently, transition flying in the traffic pattern did not excite nor challenge me much that night—nor did the Kingbird's need to do "multiple rendezvous." However, since night ARs have always been at a premium, I felt obligated to provide them with a receiver.

We arrived at the AR control point right on time; the route was over water and far enough off shore to eliminate any reference. We were flying in the proverbial ink bottle. Other than the Kingbird, there were no outside references whatsoever. We may as well have been flying in a blacked-out simulator. The initial two "join-ups" were done without a hitch

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**HONORABLE MENTION**
**1990 MAC FLIGHT SAFETY WRITING CONTEST**

and both pilots got multiple plug-ins. We settled back on a straight and level course while the tanker performed his multiple rendezvous. Due to the time involved with the "join-up" phase of an AR, I chose to let the Kingbird "take it around" when the pilot in the right seat called "tally-ho" as the tanker came into our 3-o'clock low position. This occurred three times. I must admit complacency was creeping into the picture as we droned on straight and level at 5,200 feet MSL in that black void. With "altitude" and "heading hold" modes engaged, all I did was sit there and think about how good my bed would feel tonight. However, the stimulation level was about to increase.

The flight engineer, squatting by the window in the crew entrance door, monitored the tanker's progress. He called out the tanker's position as it proceeded with its right hand race track, pulling ahead from our 3-o'clock low position, then climbing and turning to a downwind at 6,000 feet MSL. It then proceeded behind, turning and descending to 200 feet below us at 5,000 feet MSL for another overtaking rendezvous. The FE provided a running commentary. He would report "abeam on downwind" and then report again on the distance of the tanker, "tanker one mile, tanker one half mile," etc.

On the fourth pattern, the FE reported the tanker turning and descending, and then made some comment, the exact wording of which I don't recall—something about the position of the tanker being a little out of the ordinary. It was said calmly. Suddenly, he shouted "BREAK!"

I was immediately all ears. I grabbed the interphone switch on the stick and bellowed "WHAT?" As I yelled, the other pilot, looking out the right window reported that "The '130 just went by us, 30 degrees nose low in about 90 degrees of bank."

I grabbed the transmit switch on the stick and repeated several times, "We're at 5,000 feet on an altimeter of 29.92." I had no idea whatsoever what was happening but I wanted the Kingbird to know exactly what our altitude was. He replied "Roger" and said they had enough AR and were returning to base. Our refueling frequency was common knowledge so we prudently chose not to air our dirty laundry over the radio. We also returned and conducted a very intensive and extensive debrief.

This is what happened:

—Because the Kingbird crew was anxious to finish ASAP and RTB, they continuously cut the downwind portion of their multiple rendezvous pattern shorter and shorter.

—Consequently, they had to speed the descent to assure they would be at their AR altitude in sufficient time to complete the rendezvous.

—The last pattern was particularly tight, requiring an exceptionally high rate of descent.

—With the throttles at idle, one of the engine props sensed negative torque—a condition in which the prop is windmilling so fast it begins to drive the engine.

—This, in turn, illuminated an NTS caution light, causing the FE on the C- 130 to call out "NTS on number 3."

—The tanker aircraft commander sheepishly explained that when the FE reported the NTS, every head in the cockpit went to that light and they all monitored the other pilot as he pushed up the throttle to extinguish the light.

—When the tanker aircraft commander looked up he said, "All I saw was the Jolly filling the windscreen, and I kicked full right rudder and threw the yoke to full right aileron. I could make out the bulb in your rotating beacon as we went by."

—The FE on the Jolly, monitoring this, called "Break left!" and spun his head around so violently he disconnected his interphone cord.

Reflecting back, I realize that had they hit us and the investigators been aware of all the facts, they would have probably concluded that:

—The Jolly AC was fatigued and experiencing hypoglycemia.

—The AR briefing had been more perfunctory than factual with no specifics about the number of "multiple join-ups."

—The Jolly AC was complacent and probably experiencing the "Matterhorn Syndrome" which states that more people die climbing *down* the mountain than climbing *up*. (Once they reach the top, mountain climbers let their guard down since they consider the descent far less challenging than the ascent.) The actual time on the hose was the only thing that raised the Jolly's AC pulse or interest above the absolute minimum required for consciousness.

—The Jolly's AC was situationally unaware. He should have known the only direction he could have broken was left. His response of "WHAT" to the FE's call of "BREAK" is reminiscent of the United Freighter at Salt Lake City in which the pilot responded "SAY AGAIN" to a controller's transmission to turn left immediately.

—The Jolly FE was professional. He did not let the routine of the mission or the lateness of the hour detract from what he was trained to do.

—Murphy was right there to thwart the Jolly FE's professionalism by inadvertently disconnecting the interphone cord at a very critical moment.

—The C-130 crew violated the first and cardinal rule of abnormality: Maintain aircraft control. No one was flying the airplane at that critical moment.

—Additionally, the C-130 crew put too much emphasis on the NTS light. NO abnormality requires the attention of the entire crew and certainly not an NTS light.

—The Jolly copilot in the right seat might have been reluctant to grab the stick since the AC was allegedly one of the most experienced men in the squadron.

The investigators might have made the following recommendations:

—The pilot in command normally sits in the helicoper's right seat. If not a formal instructional ride, the AC should be in the right seat regardless of his qualification. If an IP needs some time in the left seat, put him up with another IP in the right seat or formally make him the copilot and appropriately sit him in the left seat.

—To avoid or minimize complacency, limit the number of repetitive accomplishments of any one maneuver; reemphasize the concept of training for proficiency rather than currency.

—Emphasize to line pilots the need to take an active role in making EVERY flight meaningful. Do not burden an already overloaded scheduling officer with keeping every flight novel and stimulating. Challenge each other to "competitions" to make the routine challenging.

—Treat night flights with the respect they deserve rather than something to be done at the end of a day filled with other things. The crew duty day is an absolute minimum. We don't routinely fly with all the gauges at the red line, *do we?* ★

After 5 years of active duty fixed and rotary wing flying and 15 years in the Reserves, Lt. Col. Komich is presently recruiting for the AF Academy. In civilian life, Colonel Komich flies for the TRUMP Shuttle.

# Are You Your Brother's Keeper?

If you had a brother you knew was a reckless driver, would you hand him your car keys? Would you just say, "Well, that's the way he is" and not even try to change his behavior or stop him from driving? Would you simply let him kill himself and maybe someone else? Of course the answer is no, and the reason is simple: He's your brother . . . and you're your brother's keeper.

Everyone in aviation is part of your family too—a family in which your brothers fly aircraft, maintain aircraft, load and refuel aircraft. Most of them do it safely most of the time. Some of the time—for some reason or other—they lose their professionalism and take chances— unnecessary risks. They push themselves and their equipment beyond safe limits—*they have accidents.*

After the accident, it's not unusual to hear other aviators in the unit say, "I knew something like this was going to happen." They *knew something was wrong.* They had seen things or heard people talking but didn't *do* anything about it—and one more aviator, one more of our military family, died.

Awareness of an unsafe practice or attitude is the first step in preventing an accident. Awareness alone, however, is not enough. Someone must care . . . care enough to stop that unsafe practice or attitude.

Aviators knew about a pilot in their unit who habitually took his aircraft below the minimum altitude on low-level training routes. They talked about it among themselves. They also knew that when he flew this way he was usually the instructor pilot and outranked the other crewmembers.

They knew he flew this way, but since he was an experienced aviator with many hours of flight time, everybody thought he knew what he was doing. No one stopped him. Then, one day, with a basic crew on board, he let the aircraft descend below minimum altitude during a low-level route and couldn't recover. The aircraft crashed and burned, killing everyone on board.

There were plenty of warning signs about this pilot's flying habits and people in the unit knew he was a high-risk aviator, but didn't do a thing about it.

*Risk takers don't change on their own. In fact, the longer this kind of behavior goes uncorrected, the more likely it is to continue until an accident happens. People knew this pilot was taking unnecessary risks, but nobody was willing to be his brother's keeper. As a result, he got away with taking chances until he took one too many and an aircrew died.*

Two C-12 pilots were flying transition at a remote site. It hadn't been a very exciting day. They decided to liven things up a bit by buzzing the tower at about 50 feet. As the aircraft passed over the tower at 120 knots, they made a break to the left and turned toward the landing runway.

After making the turn, the copilot, with only 125 hours of experience after flight school, raised the nose to initiate a climb. The C-12's nose dropped as it entered a stall, and the aircraft rolled right entering a high rate of descent. When the IP saw what was happening, he tried to tell the copilot what to do but based his instructions on what he, as a pilot with 900 hours, would have done. The copilot tried to follow his instructions but, lacking the necessary skills, hit the trees and crashed.

The IP's current commander, as well as two previous commanders, knew he sometimes "cowboyed" aircraft. He had been informally counselled several times for conducting flight maneuvers exceeding aircraft limitations. However, since he was a proficient aviator, the less-experienced leaders failed to go far enough. They did not formally counsel him or take him off IP status. They all failed in their responsibiity to let the unit commander know he was a high-risk aviator.

*Tough caring means making tough decisions about the professional performance of other members in the unit. It means policing yourself and your fellow airmen. The first time someone disregards a procedure or fails to perform to standard, someone must care enough to take immediate and positive action to change the aviator's behavior.*

A UH-1, with a crew of three and two passengers, was returning to home station. The pilot, a former maintenance technician with 3,000 rotary wing hours (more than 1,600 of them in UH-1s), told the copilot, new in the area, he was going to show him some beautiful scenery during the flight.

Flying at about 500 feet, he sighted a bay with a large boat at anchor. He descended to about 100 feet above the water to let everybody take a closer look. The Huey was flying at about 100 knots when it hit wires. The pilot was able to land, but during approach the helicopter's nose pitched down,and the aircraft began spinning to the right. The aircraft hit the ground and rolled onto its right side, injuring everyone on

board.

It was common knowledge this pilot liked to fly low and fast. In fact, some aviators refused to fly with him. He had been verbally counselled by his unit commander, but in spite of his reputation, no one took the trouble to check his background to see if he had a record of the same behavior.

He did, and it was in his records, but no one had been concerned enough to look. He had even been grounded as a result of a similar incident. Had someone cared, had someone checked, this accident might never have happened.

*Evidently, that short period of grounding did not bother this pilot much. When he arrived in the new unit, he continued to fly as always. Even when he was reported and counselled, no one brought up his past record, so he really had no reason to change. He had gotten away with it before without serious consequences. Undisciplined behavior never corrects itself. It continues until someone is killed or someone cares enough to take action.*

Aviators like these are never a secret. People know. People talk. The question is "How much do they care?" Do they care enough to do the tough thing—the caring, professional thing—and report a fellow aviator? That's tough to do, but not as tough as wondering after an accident if something could have been done to save someone's life.

*Are you your brother's keeper? In aviation, you must be. To stand by and watch a fellow aviator endanger himself and others without doing something about it, is a violation of the special trust and responsibility we have. It's not enough just to be our brother's keeper; we must also set high standards of performance in everything we do; in our professional performance of duty and our personal commitment as a member of the military family.*

* * *

*Consequences of our Silence*

*"We should all bear one thing in mind when we talk about a troop who 'rode one in.' He called upon the sum of all his knowledge and made a judgment. He believed in it so strongly that he knowingly bet his life on it. That he was mistaken in his judgment is a tragedy, not stupidity. Every supervisor and contemporary who ever spoke to him had an opportunity to influence his judgment, so a little bit of all of us goes in with every troop we lose."*

We don't know who wrote this, but it should open the door to self-examination.

We need to honestly assess our "brother's keeper" attitude. How seriously do we take our professional and personal responsibiity for the safekeeping of our fellow aviators? When we see substandard performance or a reckless attitude, do we look the other way and hope nothing happens? Do we avoid personal conflict by convincing ourselves that a fellow aviator's lack of professionalism is none of our business?

On the other hand, how receptive are we to being kept by our brothers? How would we react to a fellow aviator calling our hand about a breach of flight discipline or an occasional failure to perform to standard? Would we take offense, or would we take it to heart?

We hesitate to confront our brothers for many reasons. Confrontation is hard. But even harder is living with the consequences of our silence. *Think about it.*

Adapted From *Flightfax*

# Who's in Charge?

## A Fatal Lack of Crew Coordination

**FLIGHT HISTORY**

On 27 September 1989, Grand Canyon Airlines Flight "Canyon 5," a de Havilland DHC-6-300 Twin Otter, was operating as a sightseeing flight from Grand Canyon National Park Airport, Tusayan, Arizona. The flight was to last about 50 minutes. The airplane carried 19 passengers and two flight crewmembers.

The First Officer and Captain reported for duty at 0640 and 0715 Mountain Standard Time, respectively. The first flight of the day was uneventful, and Canyon 5 departed on the second tour at 0900. A videotape taken by one of the passengers showed takeoff, tour, and approach to the airport were normal.

After the tour, Canyon 5 reported five statute miles northwest of the airport at 0948 and was cleared to land on runway 21. Two air traffic controllers, on duty in the tower, described the airplane's approach as normal, and each controller directed his attention from observing Canyon 5, on short final, to locating traffic entering the traffic pattern. When they looked back, Canyon 5 was off to the right of the runway, and angling back toward centerline in an unusually nose-high attitude. The airplane continued to climb as it passed the tower and reached an altitude of 150 to 200 feet above the runway. At this point, the aircraft rolled left and crashed into a tree-covered hillside east of the

runway. Both crewmembers and eight passengers were killed.

America West Airlines flight 1080, a DHC-8, was holding short of runway 21, waiting for departure clearance, when Canyon 5 made its approach. The crew observed Canyon 5 in a normal attitude, about five feet above the runway, as the aircraft "floated" about 1,000 feet down the runway. The First Officer observed Canyon 5 touch down and bounce five feet into the air. He stated it "looked as if the pilot was struggling with a crosswind but there was not much wind." He commented that had there been more than 10 to 15 knots of wind, they would have felt the effects. He expected Canyon 5 to land again and glanced into the cockpit of his airplane. Approximately five seconds later, he saw a large cloud of red dust in his peripheral vision and refocused his attention to Canyon 5. He observed the aircraft emerging from the dust cloud in an "unusually" nose-high attitude and climbing. The left wing began to drop as the airplane drifted left and appeared to be "tail walking." Canyon 5 slowly lost altitude as it continued to attain a steeper angle of bank, and the nose fell below the horizon in a near vertical left bank.

Survivors reported the takeoff, tour, and landing approach appeared to be normal. They stated the pilot in the right seat was flying the airplane, and the pilot in the left seat was narrating the tour. During the landing, two passengers noted the airplane traveled along the runway at a low altitude for what seemed to be a long time. Several passengers stated the airplane initially touched down then bounced back into the air, followed by a hard landing on the right wheel. Two passengers believed the right wing tip contacted the ground. One survivor, a private pilot, stated there was a drop and a hard hit which bounced the airplane about 15 feet. He then felt a "floating" sensation as if there was no response to controls, and then "hitting" a second time. He stated that upon hitting the second time, the captain took control applying full throttle power. Several passengers reported the airplane then went into a steep nose-up attitude and a left bank. Most of the survivors reported hearing a buzzing sound or stall warning horn after the airplane left the ground the second time, and a few recalled seeing a red light in the cockpit.

## ANALYSIS

The Safety Board examined various landing and recovery scenarios which could have caused the airplane to float during the approach, bounce the landing, lose lateral control, and attain a 150 to 200-foot climb while the airplane was in a nose-high, left wing down attitude.

The airline's chief pilot stated that with full flaps, such a long float is usually caused by excess airspeed or engine power above flight idle. The excess power prevents normal deceleration while in ground effect. The Safety Board believes that either scenario is consistent with this accident. When the airplane leveled at five feet above the runway, it necessitated a secondary flare or other recovery techniques to obtain a successful landing.

With respect to the airplane bouncing in a wings-level attitude about 1,000 feet down the runway, the Safety Board could not determine if the airplane was fully stalled or if there was excess airspeed during the bounce. Certain facts, however, support the latter scenario. Passengers did not report hearing a stall-warning horn in the floating phase of the flight. After the bounce, the airplane flew another 1,000 feet before the wing tip touched the runway. Had the airplane been fully stalled at the bounce, an additional 1,000 feet of flight would be unusual. The airborne distance between the bounce and wing tip contact is more consistent with excessive airspeed at the bounce, followed by a decaying airspeed during the second landing attempt.

A bounce with excessive airspeed could develop if the power is reduced and trim of the airplane changed, resulting in a quick drop to the runway before pilot action is taken to prevent ground contact. Had this been the case, the aircraft may have skipped off the main gear or, due to the full flap configuration and resulting-low pitch attitude with excess airspeed, may have bounced off the nose gear.

Regardless of why the bounce developed, the airplane was airborne again and most likely transitioned to a near-stall condition. The events following the bounce are consistent with an attempted recovery to a landing. Although the Safety Board could not determine the cause for the loss of control when the right wing tip hit the ground, the facts are consistent with a developing stall condition. Near-stall conditions could have developed by the time of the wing drop, limiting flight control effectiveness. The observations of the flightcrew from America West, that the airplane appeared "struggling with a crosswind," are consistent with a near-stall condition between the bounce and wing contact.

The Safety Board concluded that in the absence of adverse wind conditions, the roll excursions observed by the witness flightcrew were caused by the near-stall condition of Canyon 5. It is likely that the right wing tip struck the runway while aileron control effectiveness was reduced due to the near stall.

The wing touched down about 10 seconds and 1,000 feet past the bounce, (about 2,180 feet down the runway) and came off about 90 feet later. At the stall speed of the airplane, the wing was in contact with the ground for less than one second.

The investigation found a tire skid track made by the airplane initially curved slightly to the right, consistent with the right wing down attitude. Further, the right main wheel showed extensive scuffing on the outboard face of the tire. The skid mark was caused by the airplane yawing left and was consistent with scrape marks on the wing tip.

The position of the skid track, wing tip scrape marks, and geometry of the airplane were used to determine the roll and yaw angle while the airplane was on the ground. Marks on the runway indicate the right wing tip aileron/flap hinge contacted the runway before the right wheel. Contact of the wheel and hinge with the runway surface would have required a bank angle in excess of 19.7 degrees. The scrape marks on the runway indicated that during the time the right wheel and hinge were simultaneously on the surface, the airplane's yaw angle was very small, consistent with the scrape marks on the flap/aileron hinge. Additionally, the marks indicate the airplane maintained a direction of travel about 15 degrees to the right of runway heading. After 90 feet of wing contact, the wing raised and the tire marks curved slightly to the left, lessening the angle toward the edge of the runway.

The investigation sought to determine factors which might have caused the pilots to lose control during a go-around. While the airplane was right wing down and heading for the side of the runway, the pilots' reaction might have been to raise the nose and add power. At airspeeds near stall, the downwash on the horizontal stabilizer tends to raise the nose of the airplane, requiring the control yoke to be pushed forward to maintain a normal pitch attitude for the same trim setting. Had the pilot pulled back on the control yoke while adding power, this could have resulted in the airplane lifting off in a nose-high, power-on stall or near-stall condition. In addition, the visual reference may have been misleading. According to the operations manual for the DHC-6, with 40 degrees of flaps, the airplane's deck angle is below the flight path angle during a go-around. Therefore, an increase in pitch to a 'typical" nose-up reference attitude while the flaps were at 40 degrees would increase the possibility of aerodynamic stall and subsequent loss of lift.

The fact the airplane was able to climb 150 to 200 feet in a near-stalled condition indicates full power was applied. Additionally, finding the flaps at 20 degrees at the accident site indicates the pilots either landed with the flaps at 20 degrees, or reduced the flap setting from 40 to 20 at some time between the bounce on the runway and final impact. Retracting the flaps to 20 degrees during a go-around is standard procedure. Given the company's practice to land on this runway with full flaps, it is most likely 40 degrees of flaps were used for the approach and raised to 20 degrees during the go-around attempt.

Although the captain took control of the airplane, he did not prevent the airplane from landing on the right wing tip and the outside of the right tire. His corrective actions were too late or improper since control of the airplane was lost at ground contact.

Poor crew coordination may have contributed to the captain's unsuccessful intervention and recovery. Survivors' statements about crewmembers yelling may indicate the pilots were confused about whether they should initiate a go-around or stay on the ground. This confusion could have occurred after the first bounce, when the First Officer was having difficulty relanding the airplane, or after the second touchdown and wing tip strike.

Under this scenario, it is possible one crewmember may have initiated a go-around, while the other's initial reaction could have been to stay on the ground. Such confusion could have prompted the crew to react improperly when immediate and coordinated action might have resulted in a successful go-around or landing. The Safety Board notes this type of confusion can only be minimized by close teamwork and adherence to detailed operational procedures.

## PROBABLE CAUSE

The Safety Board concluded the flightcrew used poor piloting techniques while trying to land. The captain's direct supervision of the First Officer was inadequate, and his intervention during the attempted landing was untimely or improper. To an unknown extent, confusion and resulting poor crew coordination may have complicated the captain's attempt to intervene and recover the airplane.

## APPLICATION TO MAC

Time and time again, mishap reports focus in on leadership, supervision, and crew coordination. Given the existing weather conditions and the mechanical soundness of this aircraft, it's hard to understand how two experienced pilots could allow a minor landing discrepancy to escalate into a fatal mishap. The importance of the aircraft commander stepping in before it's too late, and the entire cockpit working toward the same goal, cannot be overemphasized.

Adapted from *NTSB/AAR-91/01*

# Pilot Sunglasses: Mystique or Mandate?

## Do They Help or Hinder?

Sunglasses are as much a part of flying as the legendary white scarf and leather jacket. The choices of sunglasses available are mindboggling. Plastic or glass. Gray, green, brown, yellow or the newest addition to the family, rose. Heavily or lightly tinted. Coated or uncoated. Mirrored or plain. Polarized or unpolarized. Blue-blockers or regulars. Self-darkening or fixed color. With or without anti-reflective coatings.

In the movie "Top Gun," sunglasses were the fighter pilots' hallmark. (They were even worn in the bar!) Not surprisingly, an unsubtle competition is evolving to develop the "coolest" form of sunglasses—without regard for the adverse effects of diminished light. The price paid "to look cool" may result in impaired visual acuity. Visual acuity is irrevocably tied to available light. The indiscriminate use of sunglasses to "protect" from high ambient light conditions minimizes the retina's ability to present a recognizable image.

There are several excellent reasons to wear sunglasses. It is generally accepted that glare is harmful to the eye, even though studies show only 22 percent of the population reacts adversely to glare. Although eye fatigue is one reason to wear sunglasses, the biggest contributor to eye fatigue is not light, but refractive error—primarily uncorrected astigmatism. Exposure to increased levels of potentially harmful ultraviolet light is also a good reason to wear sunglasses. The best reason, though, is the adverse effect on night adaptation when unaltered high light levels are endured during the day.

Since visual performance is directly related to image luminace, it follows that the older eye, less responsive to changes in light levels, is at a disadvantage. There are several reasons for this. First, there is less increase in pupilary size with decreased luminance. Second, changes in the lens make the older eye more sensitive to glare. Third, there is an overall reduction in the transmission of light. This translates directly to a need for more light to be able to see and to age-related problems with visual acuity in lower levels of light.

Older pilots should wear sunglasses that allow passage of more light to the retina. To obtain the same contrast detection performance as a 20-year-old, a 40-year-old needs 40 percent more light and a 60-year-old needs 100 percent more light.

A high-level light source, such as glare, causes pupilary constriction. The smaller the aperture through which the eye must see, the darker is the image created on the retina. Nearly 25 percent of the population is acutely sensitive to glare. Their pupils are nearly pinpoints under such exposure. Diminished retinal luminance causes measurable visual reduction. Sunglasses improve this acuity problem by counteracting the amount of available light. Conversely, another 11 percent are at the opposite end of the sensitivity spectrum. These people actually have improved acuity under high glare conditions and seem to have no need for sunglasses. The remainder of the population does not care one way or the other. Glare for them is a non-event in terms of altered visual acuity.

Ultraviolet light (UV) sources include both the sun's direct galactic radiation and a clear blue sky, where these rays have been scattered as they pass through the earth's atmosphere. At the earth's surface, 6 percent of the sun's radiation is UV light. This percentage increases by 4 percent for each additional 1,000 feet of altitude, clearly presenting special hazards to aviators. There are three recognized subsets of UV light; A, B and C. UV-A passes through many types of glass and is the cause of sun-related drug reactions. UV-B is the sunburn-inducing, cataract-causing carcinogenic segment. Ordinary glass will block UV-B passage. UV-B will penetrate to a depth of three feet in water and will pass through a thin cloud layer to produce sunburn on an overcast day.

It is not necessary to wear lenses inside the aircraft to protect a pilot from the injurious part of the UV spectrum because canopy or cockpit windows are made of polycarbonate block UV-B. UV-C is absorbed by atmospheric ozone and is not supposed to reach the earth.

### Bright Day — Dim Night

A day at the beach or on snowy, bright ski slopes without protection provided by sunglasses will result in a memorable evening drive home because night vision will be severely flawed. This harmful effect commonly lasts for hours; under normal conditions full night adaptation is achieved in about 30 minutes. Failure to wear sunglasses on any day having high ambient light bleaches the retinal pigments to a point that their restoration for night use is significantly delayed.

The amount of light blocked by sunglasses is the key to how much harm takes place in visual acuity while the glasses are worn. This adverse effect exists only while glasses are actually on and does not persist after glasses are removed. Generally, the darker the lenses, the larger the loss. The "strength" of sunglasses is measured by how much light is allowed to pass through the lens. A product that blocks 85 percent of available light, (the military specification standard for aviator's sunglasses and tinted visors may have had its scientific origins in a "best guess" scenario more than 50 years ago), allows 15 percent to pass through for retinal image formation. If ambient light levels are extreme, such as from an overhead sun in a partly cloudy sky which reflect on water or snow below, such sunglasses should be adequate for the needs of the average pilot. The same circumstances later in the day, for the same person, may block too much light because the sun's angle allows for shadows that attenuate light exposure. Thus, sunglasses needed for midmorning or late afternoon may not be best suited for high noon. A lens that darkens or lightens according to the intensity of ambient light (truly photosensitive lens) would appear to be the most desirable; especially since the pilot needs metered light abatement based on severity of the exposure. However, lenses requiring UV-B to darken will not do so when worn inside the airplane since UV-B does not penetrate the canopy or windows. What appears to be the best answer to the changeable needs of the cockpit, photochromatic lenses, turns out not to be an answer at all.

Lens colors alter what is seen in different ways. Green or gray are said to give the least color distortion. Yellow is capable of filtering reflected shortwave blue found in air contaminants such as fog, haze, smoke or smog; these airborne particle suspensions blur images by reflecting shortwave blue

light in such a way that the image on the retina is diffused instead of sharp. In certain conditions, therefore, yellow "blue-blockers" can improve visual acuity, but not because they protect from glare. Yellow glass that cuts out more than 30 percent of ambient light will so alter colors that distinction between green and red lights on the airport could be a hazard. Many pilots dislike the world as seen through yellow lenses, but a daylight flight in poor visibility caused by smog, while wearing light yellow lenses, can be an "eye opening" experience. Military pilots who fly low-level missions complain that depth perception is adversely altered while using yellow lenses.

Brown will enhance contrast as well as doing some blue blocking if it is not too dark. Rose also increases contrast and blue-blocking; it offers a niche in specialized applications for automobile use.

**The Height of Cool**

Mirror-coated lenses represent the height of cool by using attention-getting metallic deposits on the surface to produce the desired mirror effect. Aside from being fragile, such coatings substantially decrease the amount of light transmission with resultant loss of visual acuity if applied to an already-dark lens.

Anti-reflective coatings on the inside surface of lenses are designed to prevent the user from seeing an image of his own eye reflected on the back side of the glass. Such images are a nuisance under certain lighting conditions and present an unwanted distraction to a busy pilot.

Polaroid lenses should be left in your boat. Their chief attribute is that they will completely eliminate reflected glare coming from a flat surface that is at an angle of approximately 53 degrees. A pilot wearing polarized lenses sees the world as constantly changing according to his angle of bank or the tilt of his head, as the angle of reflected glare is altered. Looking through a polarized window while wearing polarized glasses can result in no retinal image.

**The Bottom Line**

The amount of light passing through a lens is the most critical factor in selecting correct sunglasses. Lenses are categorized between one and four according to percent of light transmission and its basic color. Thus, you can have a Brown 3, Gray 4, Yellow 1, Green 2 or any combination of a color and a number. A number 1 lens cuts 20 percent of available light, barely enough to be noticed and, except for yellow, useful only in the world of fashion. A number 2 lens blocks 70 percent. A number 3 lens blocks 85 percent, and a number 4 lens blocks 95 percent. There is no place in aviation for a number 4 lens because of the severe reduction in visual acuity. A pilot with 20/20 vision wearing number 4 glasses has a visual acuity between 20/40 and 20/60 while airborne, even though he could be a comfortable 20/20 on the sunbathed ski slopes using the same glasses.

A number 3 lens has utility only in unusually high light situations such as flying into the sun or flying VFR just on top of the clouds in bright sun. Interestingly, number 3 lenses are most commonly used; visual acuity while wearing these lenses can be degraded to an average of 20/30.

Number 2 lens should be the aviator's friend, and then only when judiciously worn. A 30 percent light transmission presents the world with the same amount of light found in a 70 percent eclipse of the sun. That is what these glasses do and subdued light is the result. Visual acuity is reduced minimally. Wearing Brown 2 glasses, the 20/20 pilot remains almost 20/20. When looking for traffic, the pilot should remove them. Wear Yellow 1 glasses in haze or in the soup and then only if they improve vision.

Aviator's sunglasses should be glass or polycarbonate; should transmit not less than 25 percent of available light; should not distort colors, distances, or shapes; should nullify the blurring of shortwave reflected blue; and should increase contrast without misrepresentation. Their adverse effect on visual acuity must be known and they should not be worn during conditions of diminished light. There can be special times when a pair of Yellow 1 glasses (that are not sunglasses) can improve vision. Remember, being cool has a price.

Adapted From: *Flight Safety Foundation*

# Flying-Hour Milestones

## 7,500

**97 MAS**
MSgt. James S. Caron
MSgt. Brian M. Prudente

**302 TAW**
Col. Robert J. Winner/CC

## 5,000

**97 MAS**
Maj. Jeffrey R. Fine
Maj. Mark R. Sanders
SMSgt. Jerry A. Roper-Witt

**123 TAW**
Col. Clifton W. Leslie

**145 TAG**
Maj. Terry S. Treece
MSgt. Walter R. Edwards
MSgt. Archie C. Hartis

**313 MAS**
Lt. Col. Keith A. Littlefield
MSgt. Paul A. Pritchard
SSgt. Randy Lewis

**349 MAS**
Maj. Larry W. Bradford
Maj. James M. Eitel, II.

**433 MAS**
Lt. Col. Kenneth A. McClure
Maj. Dennis E. Minder
Maj. William R. Mullener
Maj. Stephen A. Vargo

**445 MAW**
Maj. Randall A. Hansen
MSgt. Kenneth Ernzen
MSgt. Maxwell Tena

**731 MAS**
MSgt. Jerome L. Olson

**928 TAS**
Lt. Col. James P. Hanny
MSgt. James P. Ingram

## 2,500

**123 TAW**
Col. Stewart R. Byrne
Maj. William H. Jones
Maj. William T. Ketterer
Maj. Richard A. Strang
Capt. George L. Cambron

**145 TAG**
SSgt. Andrew C. Birchall

**165 TAS**
Lt. Col. Lawrence W. Redman
Maj. James L. Bowlds
Maj. Edsel L. Geary
Maj. Kerry G. Towe
Capt. Christopher C. Reymann

**302 TAW**
Maj. Roger A. McFarland

**445 MAW**
Capt. Robert K. Blaha
Capt. Precht Galloway
Capt. Kevin V. Lacy
Capt. Tobin Rower, III.
Capt. Thomas G. Thompson
TSgt. Michael Forinech
TSgt. Randy T. Giggs
SSgt. Timothy G. Ellis
SSgt. Donald M. Hallwachs

**731 TAS**
Maj. Arthur J. Farrington
Maj. Dennis R. Forinash
Maj. Lawrence J. Ross
Maj. Robert G. Wenger
Capt. James M. Dugan
Capt. Timothy L. Rorick
Capt. Randy G. Rothe
Capt. Wayne C. Shackleton
MSgt. David D. Carey
MSgt. Marshall H. Hopkins
MSgt. Charles R. Lenahan
TSgt. John T. Cusack, Jr.
TSgt. James D. Riley

**911 TAG**
TSgt. Bruce A. Bair
SSgt. Archie J. Branton

**928 TAG**
Capt. Bernd R. Kembitzky
Capt. John A. Phillips
Capt. Gene L. Scamehorn
TSgt. Kelly G. Delaney
TSgt. Larr G. Mitchell

**Ranks and units are those at time of award.**

# The C-12

## Building MA

By Maj. Stephen E. Behr
Associate Editor

The weather is cold with a high overcast—typical February weather for southern Illinois as the end of winter approaches. I anxiously await the arrival of Swift 26, a C-12F flying a Tactical VFR Training (TVT) mission. My intent is to observe the flight and C-12F OSA operations. Inbound information on the flight arrives only moments before the aircraft lands.

1st Lt. Douglas R. Patterson is upgrading to TVT aircraft commander on this afternoon's flight. In the right seat is instructor pilot, 1st Lt. Stephen F. Dorian; overseeing the mission and providing simulated threats, radio calls, and safety observation, is Capt. Scott R. Schlapkohl, flight examiner and unit TVT instructor.

A weather update indicates ceiling and visibility are well above VFR minimums needed for low-level flight. The forecaster also mentions the possibility of turbulence along the entire route. Captain Schlapkohl confirms they had light chop on the first low level.

Departure from Scott AFB IL is uneventful as the C-12 climbs to 1,000 feet AGL for the flight back to Wright-Patterson AFB OH. There are no shadows due to the bright overcast conditions; it should make for an interesting mission. The first ground checkpoint is easily located—the dam on Carlyle Lake, a familiar landmark to folks who have flown in the Scott local area. Some of the remaining turnpoints won't be as easy to identify.

Captain Schlapkohl explains they normally fly TVT trainers at a constant 180-knot ground speed for ease of planning and time control. Today they're trying to maintain a 210-knot ground speed to make a "hard" arrival time back at home station so the copilot can enter predeparture crew rest. The higher indicated airspeed accentuates the turbulence.

The pilot simulates contacting a GCI site which reports the downing of an aircraft, gives UTM coordinates for the location, and advises all aircraft to avoid the area. The map reader struggles to locate the point using his chart. After what seems like an eternity he finds the point very close to course centerline of the next segment. Lieutenant Dorian gives a rough heading to avoid the area and still reach the next point. He begins to draw a line on the chart until Captain Schlapkohl points out that knowing his position is more important than drawing lines on a chart.

Lt. Reynolds conducts a walkaround inspection.

Capt. Schlapkohl and Lt. Patterson review a chart.

During a "quiet" phase of flight, Captain Schlapkohl explains, "This is the daytime upgrade ride for Doug who qualified as a TVT copilot when we started our program in October. He recently completed his upgrade to aircraft commander; now we're upgrading his TVT qualifications and completing his semiannual currency requirements.

"For the initial TVT training, we have a five-day ground school before any flight training takes place. During the flight phase, there are two daytime and

# 2F and TVT

## MAC's Future Pilots

two nighttime missions." He abruptly ends the explanation to crosscheck our position.

The crew is having trouble determining which of two man-made lakes marks the course line. Hilly terrain hinders the identification process. The correct lake is nearly six miles further along the flight path and much smaller in size. Learning to judge distances and relative sizes is part of TVT training. Captain Schlapkohl points out a difference in flying at 1,000 feet AGL versus the 300 feet AGL flown by C-130s. "At 1,000 feet you can identify landmarks at 10 to 11 miles, which makes it easy to pick out points. At 300 feet, the distance for identifying points is only three or four miles; the map reader has a much tougher task."

As the flight proceeds across the rolling hills of southern Indiana the light chop changes to continuous light turbulence. Navigating around special use airspace and airport traffic areas provides a real challenge as the flight approaches the Dayton OH area. The turbulence finally ends within eyesight of Wright-Patterson. The crew executes a tactical, low altitude, beam approach prior to landing at Wright-Patterson. After block-in, the maintenance debrief is quick—a repeat write-up of the recently installed GPWS. A crew bus arrives and we're off to the detachment offices for a post mission debrief.

The following morning provides a more stable location in which to talk about the TVT flight with two crewmembers. The pilot, Lieutenant Patterson, explains some of what goes into TVT preflight planning. "Planning takes us four to five hours, during which we select a route, 'CHUM' charts, fill out a pilot's low-level log, and spin the winds and times. Route selection is the easy part of the mission. Learning to identify ground points from map depictions is the most difficult part. On line missions, we always fly instruments or vectors under radar control. On TVT flights, we are VFR, navigating completely on our own. It's a challenge to adapt to the VFR environment after flying so much IFR."

Captain Schlapkohl offers further details about the C-12 TVT program. "We fly 1,000-foot modified contour, so we stay 1,000 AGL most of the time. To ease the pilot load during flight, we fly constant ground speed. We use the GNS (an Omega-type navigation system) for a reliable ground-speed readout. Flying constant ground speed is easier single ship when there isn't time available to spin the times and adjust indicated airspeed to meet point times. If we were flying formation, flying a precise indicated airspeed would be a requirement. There are other differences when flying low level in a C-12 versus a C-130 or C-141.

"When a C-130 is on a low-level mission, the engineer monitors systems and fuel quantity. If he detects a problem or abnormal indication, he alerts the pilots to the situation or takes care of it. In a C-12, there isn't a navigator with charts, watches, or timing log. Task saturation is a very real possibility with a two-pilot crew.

"Two things are needed on a full time basis—one is map reading, the other is flying the plane. When you start adding the other tasks—scanning for traffic, updating the GNS, time control, checking fuel quantity, checking engine gauges, talking on the radio—it all adds up to a fairly heavy work load for two pilots, even when everything is running smoothly.

"Missions are planned for three to three-and-one-half hours. That's just long enough to learn and experience a little fatigue, but not reach the point of total fatigue. Seeing how fatigue messes up one's judgment is part of the learning process. Flying at 1,000 feet and having an extra pilot on board adds a margin of safety."

Operational support airlift (OSA) is still the mainstay of C-12 unit operations, whether at Det 2, 1401 MAS at Wright-Patterson AFB OH, or at one of the other bases where C-12F aircraft are located (Elmendorf AFB AK, Andrews AFB MD, Nellis AFB NV, Scott AFB IL, Clark AB Republic of the Phillipines, Kadena AB Japan, Osan AB Korea, and Ramstein AB Germany).

Lt. Col. James H. Lonas, Operations Officer and C-12 pilot, provides some insight into the unit's OSA mission and TVT training.

"We're providing very good lead-in experience for new UPT graduates who will fill C-130, C-141, and C-5 cockpits in the future. It's tough to beat the experience C-12s can provide—they are up and down all day long. From a practical training viewpoint, it's an outstanding mission. Instead of flying one or two approaches per day like a strat airlift crew might, these folks get three to five approaches on every mission and fly three, or even four missions per week. They see a wide variety of airfields ranging from major civilian airports and military bases of all services to small, uncontrolled, minimum runway airports in the middle of nowhere. For gaining experience, there is a lot to be said for OSA.

"The addition of TVT has meant extra hours to

build and conduct training. Our crews have taken the program seriously and the cadre who put the program together has done a very good job. We're seeing the early stages of better use of the aircraft—not limiting the aircraft to the traditional stateside OSA role. TVT is helping develop a capability to do other things with these airplanes—to participate in exercises. But before we can do that, we have to educate our customers about the service we can provide them. The more visibility we have during exercises, the sooner customers and planners will understand how we can contribute to their operational readiness. This is the early phase of educating the rest of the military about the potential of C-12s."

During *TMF*'s visit to Wright-Patterson, I'm able to ride on a typical OSA mission for the unit—a one-day, three-leg mission with a stop at Andrews.

Capt. Dean Sollman and Lt. Patterson planning a night TVT route.

Mr. Joe Enderle, BASI, replaces a wingtip light assembly.

I meet the aircraft commander, Capt. Kathryn A. Benka, and the copilot, 1st Lt. Deana R. Reynolds at the OSA maintenance hangar before sunrise.

The folks from Beech Aerospace Services, Inc. (BASI) are on hand to meet the crew and lend assistance with preflight duties. BASI provides maintenance and supply support for the C-12 program. Captain Benka completes the interior preflight, while Lieutenant Reynolds takes the exterior preflight inside the well-lit hangar. BASI tows the aircraft to the ramp for engine start and completion of engine runs to check all engine and propeller-related systems. With engine runs completed, it's time to taxi back to the ramp by base operations to wait for the DV.

It's a short wait. A passenger terminal representative brings out the manifest and the DV arrives. When everyone is aboard and the baggage is secured, engines are started. The C-12 makes a midfield, intersection departure from the 12,600-foot runway with ease. Climb out at 165 KIAS is smooth—no hint of turbulence, unlike the low-level flight. At FL 270, the morning sun is bursting through the front windshield all the way to Andrews. As the flight approaches the Washington DC area, center descends us to 7,000 feet, where we skim along the tops of scattered clouds, cross over the arrivals into Washington National, and receive vectors for a very short ILS at Andrews.

Favorable winds have pushed us 30 minutes ahead of schedule. There is enough ground time to grab a quick bite after checking the weather and NOTAMS. The wind that helped speed the trip to Andrews will extend the leg to Maxwell AFB AL to well over three hours today. Arrival at Maxwell is 15 minutes after schedule, despite departing Andrews 18 minutes early. Once on the ground, we wait for the general who will fly the C-12 back to Wright-Patterson, to arrive.

On the way northward, the sun is beginning its slow descent in the west. Light snow is in the forecast for our arrival. Descent into the terminal area takes us into a cloud layer where ice begins to form on the wings, but not thick enough to warrant using the deicing boots. Landing data is computed for a wet runway, making the landing distance close to 7,000 feet. Below the cloud deck, it's clear—no precip yet—the runway is dry; landing distance is less than 3,000 feet. A typical OSA mission nears completion. The DV greeters salute as the general steps out of the Beechcraft. The ramp is quiet as the BASI crew chief approaches to debrief the crew and move the aircraft back to its hangar. In a few hours the mission cycle will begin again and another crew will gain experience to take forward to other aircraft.

# Vacation Time Trouble

## The "Two-Way Rush" is familiar to many of us.

Summer is finally here and a lot of us are probably planning to take a vacation. We all look forward to this time—getting away from it all, catching up on our sleep, eating what we want, doing what we want, when we want.

Sounds great! What could possibly mean trouble? Well, let's look at what can happen.

Before we take off on this long-awaited and much deserved vacation, we experience the "two-way rush!" It's a familiar scenario. At work, we press to finish hot suspense items, as well as press ahead to complete the paperwork . . . and then there's flying those last few sorties!

And the rush is on at home . . . mow the lawn, tune up the car, stop the newspaper, and run last-minute errands. Needless to say, this "two-way rush" starts all over when we return. We fight the "catch up" syndrome both at home and at work. All this double duty spells fatigue.

**Fatigue and Mishaps**

Fatigue has been reported as either a suspected or definite contributing factor in some USAF Class A mishaps. Our data base contains numerous mishaps where fatigue was a *definite factor* and many where fatigue was a *suspected* factor. It does happen! Fatigue does cause serious trouble and definitely affects flying performance.Fatigue is hazardous. It produces carelessness, forgetfulness, sloppiness, slowed reactions, inappropriate reaction, irritability, disinterest, and the loss of timing involved in performing tasks. It erodes judgment and causes lack of attention—distraction, channelized attention, and inattention. It can produce a subtle erosion of performance along with an inability to recognize it and an unwillingness to correct it.

Although you may be aware of the properties of fatigue, it's *always* useful to review the situation since knowledge and understanding provide essential means of promoting flight safety.

### Types of Fatigue

There are two categories: Acute or short-term, and chronic or long-term fatigue.

—Acute or Short-Term Fatigue—Acute fatigue is a short-lived common occurrence. Some causes of acute fatigue include inadequate rest, mild hypoxia (oxygen deficiency), physical stress, psychological stress, and circadian rythm upsets that interfere with sleep (timezone change).

—Chronic or Long Term Fatigue—Persistent fatigue results from long workdays, chronic sleeping difficulties, or lack of exercise. A common source of chronic fatigue for crewmembers is the long duty day and long work week.

### Countermeasures

Prevention in the form of recognition, proper mission planning, and physical conditioning will help us remain safe and avoid the pitfalls and distractions caused by fatigue.

—**Recognition**—The first step in prevention is to recognize the problem. We should be aware that around vacation time, we have lots of things on our mind besides flying. We need to use self-discipline and good habit patterns we've developed throughout our flying career.

—**Mission Planning**—With today's complex sorties, thorough mission planning is more important now than ever. We must be extra cautious and alert during the more demanding portions of the mission. Prior to every mission, crewmembers should include fatigue when assessing their personal capability to perform the mission. There is a point beyond which operations may not be *safe*.

Use common sense—stay on the ground until alertness and energy are restored.

If facing a heavy schedule upon return to work, come back a day early. Also, prioritize tasks both before and after a vacation to eliminate unnecessary demands.

—**Physical Conditioning**—Maintain proper diet, hydration, adequate rest and sleep, and proper physical conditioning.

### Top Condition

Our modern-day aircraft are complex and sophisticated and demand we be in top mental and physical condition. When in top condition, we are the most important part of the aircraft system . . . but when not, we become the weakest link in the chain. So, as we prepare to "get away from it all," the responsibility for minimizing fatigue and maintaining maximum performance rests with us!

Have a good leave and fly smart!

Adapted From *Flying Safety*

# Stress and the Pilot

Pilots come in all sizes, shapes, and ages. We come from different family backgrounds, different economic situations and have varying flight experiences. No two of us are exactly alike, yet, we face the same challenges in the air. We take off, fly, and land. Regardless of whether we are flying a "homebuilt," a Piper or Beech, a C-21, C-130, or C-5, we address the same challenges in flight. Some of us are more psychologically resilient and less susceptible to stress than others. But each of us faces stress to a degree. Each of us copes in differing ways. In that ability to cope lies an almost secret key to individual pilot safety and accident prevention. Understanding stress and its potential impact can be difficult. Recognizing stress is even more difficult because, as we mature in the process of gaining experience, we build defense mechanisms that alter our ability to admit to ourselves that pressures of life or specific situations are indeed stressful. Our reactions to various forms of stress are also based on physiological and psychological characteristics with which we are born. What can be stressful at one point in our lives may not be stressful later.

### Background

The image we hold of ourselves can be one of supreme ability—we believe we can cope with even the most demanding situation. Is this correct? Are we as good as we think we are? True, we train and fly in a demanding environment and should have

confidence and take pride in ourselves to the extent that we are professionals. Only you or I know how good we really are. If we do not critically analyze and measure that opinion of ourselves, we could be an "accident waiting for a place to happen!"

We do not prevent accidents by creating a fear of flying in the pilot. To do so is wasteful and creates more stress than might normally be expected. Flight training provides knowledge and understanding of the airplane and the environment in which we fly. These are the pilot's balance to stress and help combat unwanted fear.

The size of the airplane can have little to do with the level of stress on the pilot. True, more things might go wrong in a bigger and more complex airplane, but the pilot of the fixed-pitch, rag-covered airplane and the pilot of the supersonic jet must each deal with stress levels in his or her everyday flying life. Also, the pilot's view of aviation risk changes as a function of experience measured in total flying time. This is true regardless of the complexity of the aircraft flown. Reaction times required to deal successfully with events may be vastly different between airplanes, but the effect of stress brought into the cockpit by the pilot, regardless of the complexity of the airplane, can be the same.

The difference between pilots in coping with stress, is in the degree of stress "experience" and how each individual reacts to pressure. There can be no set answer, and we are not saying that all stress is bad. Some flight-related stress can increase our attentiveness. Large amounts of family or business-related stress will have differing effects on different pilots. There is a stress level for each one of us where personal caution flags should go "up," where we should consider whether or not that stress could inhibit our normal healthy ability to think, react, or fly.

The combination of lifestyle and flight stress can lead to forgetfulness, lack of recognition of developing cues, lack of attentive focus and, in the worst of all cases, an accident. These two types of stress need to be understood to be recognized. Learning to leave lifestyle stress out of the cockpit is key to long-term survival. Learning to place stress cues in the preflight decision-making process can prevent accidents.

**Life-style Stress**

Critical life events or unsettling personal experiences create stress that relates to you and your immediate family. A serious disagreement with your spouse, the severe illness of a child, or a major financial crisis, are examples of lifestyle stress. Stress can also be generated by failure to succeed at key personal endeavors. Being late or the rush to get somewhere on time can create stress. Dissatisfaction or concern in the workplace can be carried into the cockpit in the form of stress.

Positive events cause stress, too: an upcoming marriage, a new job, a new baby. One study found that, of those pilots who had accidents, a significantly higher percentage were experiencing lifestyle stress at the time of the accident.

**Flying Stress**

Stress while flying stems from the man machine interface. How comfortable do you feel flying your airplane? Is this a first flight in a new type; are you well checked-out or are you "winging it"? Have you just had a disagreement with an air traffic controller, or an Automated Flight Service Station specialist? Has another aircraft cut you out of the pattern or another pilot been discourteous? Are you making a flight you did not want to make? An instrument approach to minimums or lengthy ATC delays can create stress. Flight stress can come from lack of ability to cope with or control our flying environment. A Near Mid Air Collision (NMAC) can provide enough stress to warp our decisions for a whole day.

Ironically, accidents can be caused by lack of stress, i.e., by complacency. A certain amount of stress can sharpen our focus on the task at hand and is healthy.

### Magnitude of Stress

How much stress, then, is too much? How much is too little? There is no definitive answer, but we can identify the kinds of things that are stress-related and provide arbitrary, relative values derived from opinions of experienced pilots. By identifying our own stress-related life events, we can recognize how those events could be stressful. By adding the values assigned, you can begin to find a stress range for yourself. With some subjective reasoning, you should be able to decide if stress is a large enough factor in your life to warrant accommodation on your part. At a minimum, being aware of stress in others helps us see it in ourselves.

Stress for one is not necessarily stress for another, as pointed out earlier. A pilot compelled to be on time for an appointment or make a return flight can be trained to delay or cancel the flight. The mature pilot knows that the need to keep an appointment does not merit the risk of killing oneself. Also, stress can be subjugated through experience and knowledge. As your piloting skills increase, you can achieve flight despite increasingly difficult conditions. However, there is a point where even the most accomplished pilot can be affected by stress and should make a no-go decision. This is a matter of judgment, and the hazard of modification of good judgment by stress should always remain a very real concern.

An accident is the culmination of a series of events, each of which has reduced the pilot's choices or flexibility by some amount. Then, there is one final event: the pilot has no choices left, and the accident occurs. However, before the accident occurs, those single events leading to that accident are masked by lack of recognition or attention. Since over 76 percent of all general aviation accidents are human error-related, stress—even the lack of stress—can be key factors in human error. We need to understand this process of events

**MEASUREMENT OF STRESS**

**GROUP A-LIFE-STYLE STRESS***

| | | |
|---|---|---|
| 1. | Have you had a death in your immediate family? | 50 |
| 2. | Do you suspect your business partner is cheating you? | 40 |
| 3. | Is there a serious life-threatening health problem in your family? | 37 |
| 4. | Are you experiencing uncertainty about your spouse and the possibility of an extramarital affair? | 36 |
| 5. | Have you had insufficient rest between flights or had lack of sleep over the past few nights? | 34 |
| 6. | Are you experiencing difficulties with your children? | 33 |
| 7. | Is your wife due to deliver a child shortly? | 32 |
| 8. | Have you recently had a serious disagreement with your spouse? | 31 |
| 9. | Are you recently recovering from substance abuse? | 30 |
| 10. | Are you having serious financial problems? | 29 |
| 11. | Are you facing the threat of court or government action relating directly to you? | 29 |
| 12. | Are you about to or have you made a recent important health-related decision? | 28 |
| 13. | Are you concerned about your current employment? | 26 |
| 14. | Is your child getting married next week? | 25 |
| 15. | Have you very recently moved to a new location? | 23 |

*Table and values are derived from Professional Pilot Self Readiness: A Study of Air Carrier Pilot Stressful Life Events

**GROUP B-FLIGHT STRESS***

| | | |
|---|---|---|
| 1. | Have you had a serious disagreement with someone flying with you in your aircraft? | 50 |
| 2. | Are you experiencing system (engine, control, fuel, electrical, hydraulic, communication) malfunction? | 50-30 |
| 3. | Have you had a NMAC on this or last flight? | 47 |
| 4. | Are you concerned about deteriorating weather on this flight? | 45 |
| 5. | Have you had a disagreement with ATC or FSS personnel? | 43 |
| 6. | Has another pilot caused you delay or inconvenience in the airport traffic pattern? | 40 |
| 7. | Have you been denied entry into an airspace you feel you have a right to enter? | 32 |
| 8. | Have you had to "go around" because of tower instructions or because of another pilot? | 32 |
| 9. | Have you been "violated" on this flight for an infringement relating to the FAR? | 31 |
| 10. | Are you transitioning to a more complex aircraft that you intend to fly at this time? | 28 |
| 11. | Have you just now almost had an accident because of what you did or did not do? | 25 |
| 12. | Are you flying VFR in a high-density traffic area (TCA, major airport, busy non-towered airport)? | 24 |
| 13. | Have you had frequent or lengthy ATC routing changes? | 23 |
| 14. | Have you been given what you feel is an unreasonable request by ATC? | 20 |

*Table and values are taken from interviews with experienced pilots

in order to apply good reasoning to our flying decisions, particularly where stress could be a factor in what we decide.

**Measurement of Stress**

We have provided the questions in Figure 1 to help you identify and understand typical lifestyle stressful situations. If you answer "yes" to a question, assign the full value as your score for that question. You can give partial values, if desired. If your total score for Group A, Life-Style Stress, is in the range of 50 to 70, you could be strongly susceptible to stress-related decision impairment.

We have provided the questions in Group B to help you understand typical stressful situations in flight. Score this group as you did for Group A and come up with a total. If your score for Group B questions is in the 50 to 70 range, the next flight decision you make could be influenced by stress, and you should be fully alert to this fact.

Some scores in Group B are not necessarily additive to those in Group A. As an example, experiencing an airplane system malfunction could erase lifestyle stress as you focus sharply on the problem at hand. Conversely, flight stress created by a disagreement with an employer, a controller, or a copilot could be additive to lifestyle stress. The relationships are not abundantly clear, and more investigation needs to be done in this area.

Group A type stress can be protracted and chronic and can affect our reasoning powers. It produces mindsets and attitudes that preoccupy us. Our decision-making ability can be altered and can affect the flight we are about to make or are making. We can carry them with us for relatively long periods of time. They can hang in the background of our minds and alter our reasoning process in subtle ways.

Group B questions relate to the flight we are making or are about to make. Flight stress is usually immediate and short term and can lead us to overlook the next or developing challenge. Our attention is focused elsewhere. We are prone to forget one or more items on our mental checklist. Each of us is susceptible to these stresses; yet, it is also from these flight situations that we learn what not to do. We learn to cope, which enhances our stress tolerance over time. Even the most experienced pilot can become stressed at times, resulting in a bad decision or forgetting to do something.

There can be an interrelation between the two types of stress. Lifestyle stress carried into the cockpit creates a more acute atmosphere into which flight stress items may be introduced.

Some stress can be beneficial, and there is a danger of too little stress. As we prepare to take off or do a difficult or demanding maneuver or task, we need to focus all of our attention on the task at hand. The proper amount of stress creates the necessary attention and stimulates our thought processes to complete a maneuver successfully. It is not this stress we are focusing on. We are examining the unwanted stress, the excess baggage that should have been left behind or, if encountered while flying, filtered from succeeding decisions. If we cannot separate ourselves from this unwanted stress, then we should keep our two feet firmly planted on the ground, and out of the cockpit, until we do overcome it.

Knowledge and experience overcome stress to a large degree but never all of it. You cannot have knowledge and experience without having had to deal with stress in large doses. Many have not learned this, or perhaps their opportunity was cut too short. The reason for this article is to learn from what has transpired before. Our collective safety strength lies in the fact that we study accidents so we don't repeat them.

**Conclusion**

Every pilot experiences stress. It is a product of flying as it is a product of any other demanding pursuit. One person's stress can be another person's motivation. When lifestyle stress levels increase or compound, we need to be alert to the fact that we could be moving into the "gray zone" of decision-making. Here, nothing is black or white. We can move into this "gray zone" so subtly that it is not apparent to us. Being aware this can happen keeps us alert in our decision-making process and can prevent stress overload. The absolute measurement of stress is not as important as recognizing its presence. We should learn to use our newly-honed perception of stress as a valued personal flying decision-making tool. ✈

Adapted From: *FAA Aviation News*

# C.R. TERROR

## The Aviant Aviator Leads the Flock

"Just look at that sky tonight, Sammy m'boy," exclaimed the Ace of Aerospace to his trusty right-seater. "Why, there're so many stars out tonight I can't even count 'em."

"That's right, Boss. And counting over 10 might prove difficult with your flight boots on," bantered the cheerful copilot.

"So that's what they taught in that assertive sensitivity course, huh," retorted the Rotund One, snubbing his sidekick's newfound wit. "Well, I still love to fly the old Hercules on nights when the stars shine so brightly. And look, there's the Belt of Orion and the moon is right next to it," continued the Starstruck Skipper, ready to give a detailed tour of the heavens to his less-than-appreciative right-seater.

"Well, you're right about the moon, sir," Sammy complimented pleasingly, "but I believe that's the planet Venus next to it. See how it's among the brightest spots. . . ." The competent copilot was cut off in midcorrection.

"Nonsense, Sammy m'lad," muttered the Magic Major. "It's too bad Blinky's not flying with us tonight. He always knows where these stars are and their strange names. He would substantiate my vast astronomical knowledge—if he was here, that is."

Quickly turning to a completely different subject in which he hoped Sammy was less knowledgeable, the Errant Aviator asked, "Speaking of real estate, how high can these interest rates go?"

Not to be outdone, Sammy queried, "Speaking of things that are high, Boss, did you ever hear from higher headquarters on that Quality Eagle item you sent in?"

"You bet I did," responded the Prince of Pilotage, now comfortable with a more familiar subject. "Remember the way we had to fill in all those blocks on the '781 to log flying time? Well, I figured out a better way—in fact, it cuts the paperwork by a fourth. I sent in my idea as a Quality Eagle Initiative and it was approved in just a few days."

"What is this Quality Eagle stuff, anyway?" asked Sammy.

"It's a way of recommending

improvements, getting rid of barriers, and resolving problems in a hurry. Take my masterful contribution, for example; after I realized there was a better way, I cleared the idea with Colonel Fang, and it went to the Wing Quality Council. They agreed it was brilliantly stupendous and passed it to the Wing Commander, who passed it to HQ MAC/QSQ. You know, Sammy m'lad, these Quality Eagle Initiatives give NAF, Service, and Wing Commanders direct access to the HQ staff to work some pretty important stuff. The HQ staff has a two-workday goal to evaluate what's sent in and get back to us. So far this year, over 70 percent of the stuff sent has either been approved immediately or sent, for approval, to the people who handle it. It just goes to show ya a lot of people are working pretty hard to get a 'quality' culture rolling in MAC. Now, as I was saying, Sammy. Uh, what was I talking about anyway?" wondered the Befuddled Field-Grader.

"It was either stars, real estate, or quality, Boss, but since you've got a checkride coming up next month, why don't you make it high altitude penetration descents and ILS approaches," reminded the right-seater.

"Ahh. Well, I'll just have to hit the books hot and heavy. And there's no time like the present, eh Sammy?" pledged the Omnipotent One, whose V-file back at the squadron was packed with unposted changes and whose out-of-date Dash One was listed in the National Register of Historical Landmarks. "What's the hot topic of the month from the stan-eval weenies?"

"I believe they're emphasizing techniques for avoiding birdstrikes. The wing has had a lot of damage recently," briefed Long Suffering Sam.

"Birdstrikes? I'll be ready. Now pass up the terrain chart for Andrews. I'll review it and the approach plates before I take a short snooze. It's never too early to be thinking about the approach," reasoned the Airedale of the Airways as he promptly yawned and closed his eyes.

"Engineer, copilot. Looks like the Chief is getting serious about flying. Maybe we'll have a good trip this time. What do you think?" whispered the right-seater, being careful not to wake his dozing AC.

"I certainly hope so, sir," replied Sergeant Torque. "Colonel Fang would be amazed, not to mention relieved."

A couple of hours later, the Rhinestone Flyboy stretched, looked down at his 14-carat aluminum digital chronometer, and checked the present position and winds in the SCNS. Astutely assessing the time-rate-distance sit-

uation, the World's Greatest Airlifter exclaimed, "Full speed ahead, Sammy m'lad! We're nearly 10 minutes behind our scheduled blocks."

"Calm down, sir. We'll make Andrews by 2200 local if the winds don't increase," explained the competent copilot. "We'll get those maintenance parts there on time."

"Parts? What parts? Oh yeah, the engine. I remember now. The broken helicopter's AC is supposed to meet us when we land," recalled C.R.

"Sir, I believe Captain N. A. Hustle also wanted us to have the Andrews command post relay our arrival to him when we land."

"Exactly right, Sammy," attested C.R. "Merely probing your grasp of operational detail. As you know, I depend on you to handle these trivial matters."

Major Terror picked up the trip folder and looked at the itinerary for the third time. "With a little luck, we'll be back at the home drome by 1 A.M.," muttered C.R. as he pulled out his wallet. "Rats! Looks like I'm a little short on cash. I'll have to make an early morning rendezvous with the 'King Kard' automated teller at the base credit union. That mechanical marvel of financial wizardry always has an ample supply of loot."

"Why the need for cash in the middle of the night?" asked the right-seater.

"Why, don't you know it's *summertime*?" blustered C.R.

"So?" questioned Sam. "What does that have to do with cash in the middle of the night?"

"So!" the MAC Maverick Exclaimed. "As soon as we land back at home station, I've got 20 days leave at the seashore. It's sun, sail, and surf for me. Besides, I got this incredible price on a time-sharing rental condo at Bikini Dunes. It's ocean front and there's even an amusement park, or so I've been told. The only thing I need before I hit the road is some folding money."

"Bikini Dunes, Boss? Don't you mean Folly Dunes?" asked Sammy.

"No, it's Bikini Dunes and I hear it's well named, but enough of this banter," concluded the Airlift Lothario. "We'd better prepare for our Andrews arrival. What's the weather, Sammy?"

"Andrews Metro reports there's a fog bank between 1,000 and 2,000 feet. Below the fog bank, visibility is seven miles plus," replied the right-seater. "And they've reported some migratory birds in the vicinity of the field."

"At this time of night, Sammy? Birds gotta sleep *sometime*. Probably a figment of some flaky flier's imagination. Descent check, engineer," requested C.R.

The Herk crew began their descent into Andrews. ATC momentarily leveled the crew at 5,000 feet.

"Well, there's the fog layer at about 2,100 feet. It's about time you learned one of my fog penetration tricks," instructed the Ace of Airlift.

"Right, Boss. Uh, any sign of those birds?" reminded the competent copilot.

"Birds, what birds? There aren't any birds out this late at night, Sammy," asserted the All-Knowing Aviator.

About that time, the quiet of the Hercules cockpit was shattered by the dull thuds of something hitting the aircraft. "Whack! Thump! Thump! Thump!"

"Yipes, Sammy! We're under bird attack," yelled C.R. ducking his head beneath the eye level of the wind screen. "Battle stations, right full rudder, damage control report!" shouted the Silver-Tongued Skipper, momentarily lapsing into naval jargon.

"Pilot, engineer, I'm going back to the cargo compartment to help Sergeant Downs check for damage. And it sounded like the birds hit the radome, too."

Sammy calmed the Addled AC and directed a controllability check, after which C.R. made a passable straight-in approach at Andrews. As the Worried Warrior completed a walkaround inspection with Sergeant Torque, they counted the remains of eight ducks on numbers two and three engine cowlings, the radome, and the left gear door.

"Sammy," commented the Avian Ace, after consulting with the wing safety folks, "it appears we were victims of an unprovoked attack by a whole flock of Fowl Fliers. How was I to know migratory birds sometimes fly just above the fog layers? And because you didn't detect them in time, I may very well be forced to slip my vacation a day or two," commented the Ace of Alibis.

Sammy, feeling unjustly scolded, nevertheless replied, "You could be right, Boss. You could very well be right." ★

# QUICKSTOPPERS

## The Final Exam

On descent for an en route stop, on a routine aeromedical evacuation mission, the flight mechanic began feeling lightheaded. He sat down and a flight nurse saw the flight mechanic's eyes roll when he lost consciousness. Although the nurse tried to revive him, he would not respond to verbal stimuli or shaking actions. He recovered spontaneously after 20-30 seconds. An onboard flight surgeon ordered an intravenous solution due to dehydration. The mission continued to the RON base with the flight mechanic in patient status. He was seen by a flight surgeon at the RON base and cleared for flight duty. Investigation revealed the flight mechanic, a reservist going to college full time, had missed several meals and gotten only a few hours rest the previous night due to studying for finals. He was also dehydrated and this, combined with the above, caused him to momentarily pass out. Again, proper diet and rest cannot be overstressed for aircrew members.

## Once Ya Get It Started, Ya Can't Get It Stopped

The crew of this C-141 departed home station for an overseas location. On departure, they experienced extreme vibration coming from the nose gear so the aircraft commander elected to divert back to home station to check it out. The crew contacted command post who recommended they jettison fuel to reduce gross weight for landing. They accomplished the fuel jettison checklist and jettisoned 60,000 pounds of fuel to obtain an aircraft landing weight of 250,000 pounds. After jettisoning and checklists were complete (all aux tank boost pumps off, main boost pumps on, and crossfeed and separation valves closed), the scanner reported the left jettison mast was still draining fuel. The engineer recycled the left fuel jettison valve circuit breakers to no avail. The crew suspected the left jettison valve was siphoning fuel from the number one aux tank and declared an in-flight emergency. They made an uneventful landing with fuel still draining from the left jettison mast. They stopped on the runway and accomplished the "fire on the ground" checklist. Passengers and crew evacuated the aircraft while the left mast was still draining and before maintenance could manually close the valve. The fire department contained all of the 250 gallons of fuel on the runway. Maintenance investigation revealed the wire on the closed side of the valve was not connected. Obviously, a professional crew in action.

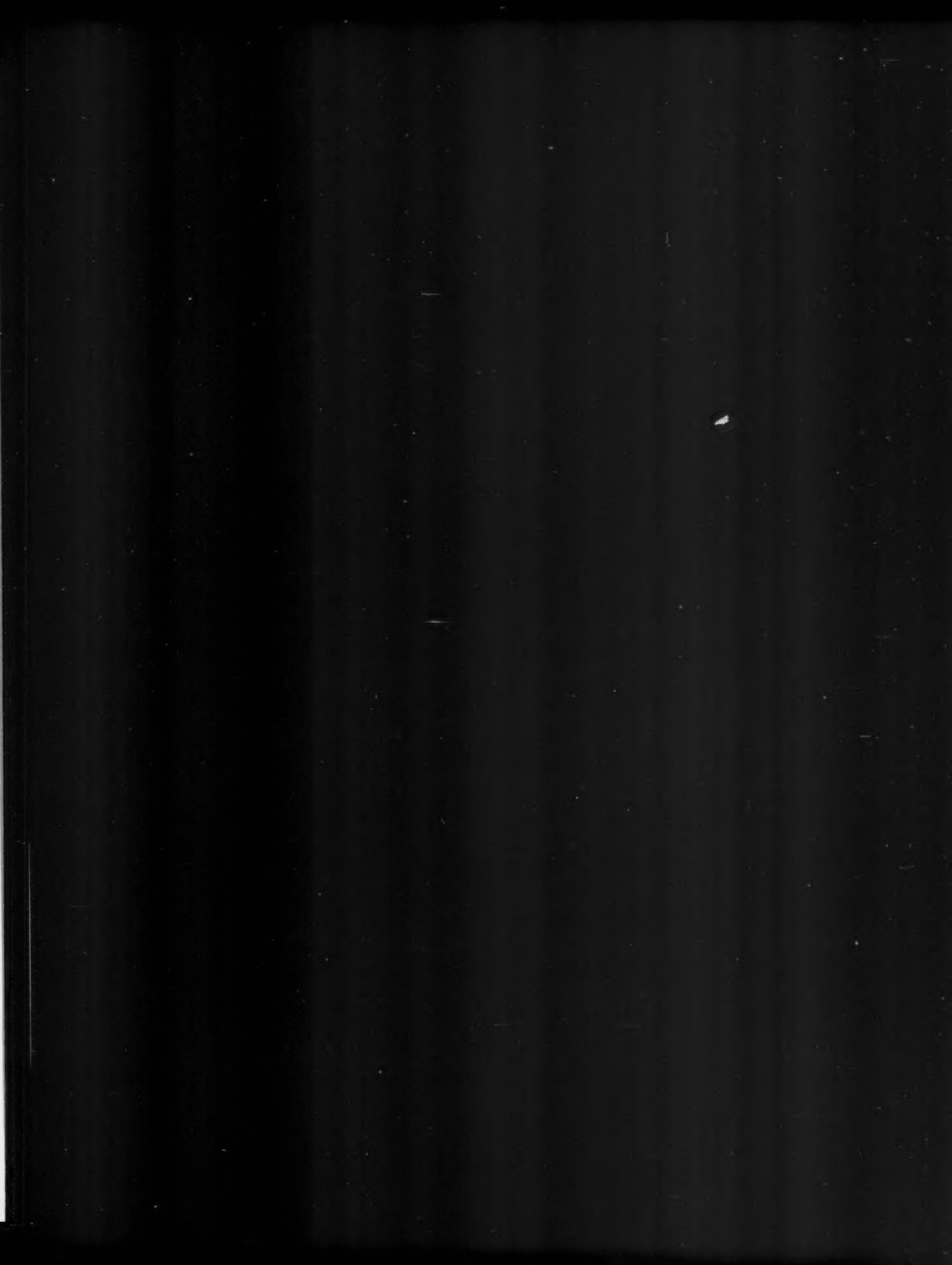
## DON'T GET YOUR WIRES CROSSED

After a firm touchdown, the C-130's copilot lightly applied brakes to confirm positive brake action. The right main landing gear aft tire blew approximately 1,000 feet after landing, damaging the outboard and inboard main gear doors. The aircraft pulled slightly to the right and the aircraft commander slowed to taxi speed prior to applying any further braking. The antiskid system had checked good on final approach. The wheel and tire were changed and damaged doors removed for the gear-down flight to a repair location. Upon inspection, maintenance found antiskid wiring for the right forward and aft wheels wired backward. They targeted their investigation to this area because of a previous similar mishap determined at the time to be an isolated case. A one-time antiskid inspection led to the discovery of another aircraft with one side of the main landing gear wired to the terminal control with prefabrication wires—the kind typically installed during PDM. As a result, the wing prepared a recommended change to the technical order accounting for both current and continuity of the anti-skid system following main landing gear maintenance. In addition, all users of this particular PDM facility were informed of the wiring problems.

# QUICKSTOPPERS

## A MID-AIR WITH SURVIVORS

The first Cessna 152, on a local training flight at an overseas location, had completed 30 minutes of air work when it proceeded to an intersection near the home base. It was approximately 1.5 miles NNE of the intersection, heading 225 degrees at 2,000 feet, when it was struck by another Cessna 152. The second aircraft's right wing struck the right horizontal stabilizer and trim tab of the first aircraft from behind. The jolting force caused the first Cessna to yaw right about 20-30 degrees and bank right approximately 20 degrees. According to the FAA investigator, the propeller of the second aircraft may also have made contact with the right horizontal stabilizer of the first. The pilot of the second Cessna reported a heading of 180 degrees and altitude of 2,200 feet just prior to the mishap. Both pilots performed controllability checks and landed uneventfully at their intended destinations. Weather was not a factor. Investigators found both pilots at fault for failing to "see-and-avoid." Additionally, the board found the second pilot had failed to transition southbound at or above 2,500 feet as recommended in the airport directory and flying safety manual. All in all, Lady Luck was with each party concerned.



# After Deadlines

**NEW MAC VICE COMMANDER NAMED--**Lt. Gen. Robert L. Rutherford was nominated to replace Lt. Gen. Anthony J. Burshnick who retired 1 April 1990. General Rutherford entered the Air Force in 1961 following graduation from Southwest Texas State University. General Rutherford, a native of Luling, TX, is a combat veteran with over 100 missions over North Vietnam and a command pilot with over 4,000 flying hours.

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**MAC CONTINUES TO GIVE HELP--** As of 22 April, MAC flew over 250 missions in support of Operation Provide Comfort as part of the international relief effort to help Kurdish people fleeing Iraq. MAC airlifted more than 8,000 tons of supplies. The command's C-130s, along with aircraft from several NATO countries, have delivered more than 1.5 million Meals-Ready-To-Eat, 65,000 blankets and 170,000 liters of water. MAC routed most of the relief supplies through its major ports at Dover AFB, DE., and Charleston AFB, S C C-5 Galaxys and C-141 Starlifters flew to Rhein-Main AB, Germany, then on to Incirlik AB, Turkey. Much of the cargo was then delivered by C-130s from the 37 TAS, Rhein-Main AB, Germany, the 61 TAS, Little Rock AFB, AR., and the AF Reserve's 302 TAW, Peterson AFB, CO..

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**NEW UNIT ACTIVATED--**MAC activated its newest air rescue squadron, the 66th Air Rescue Squadron, at Nellis AFB, NV. Commanded by Lt. Col. Ronald Hahn, the 66 ARS, is the Air Force's first U.S. based, active duty squadron to fly the MH-60G Pave Hawk helicopter in a combat rescue role. The unit's initial aircraft are UH-60L models similar to the Army's Black Hawk helicopters. The Pave Hawk is the Air Force's newest addition to its combat rescue force. The 66 ARS' activation is part of the modernization of the Air Rescue Service forces as it converts its Vietnam-era HH-3 Jolly Green Giant helicopter fleet to the MH-60G Pave Hawks.

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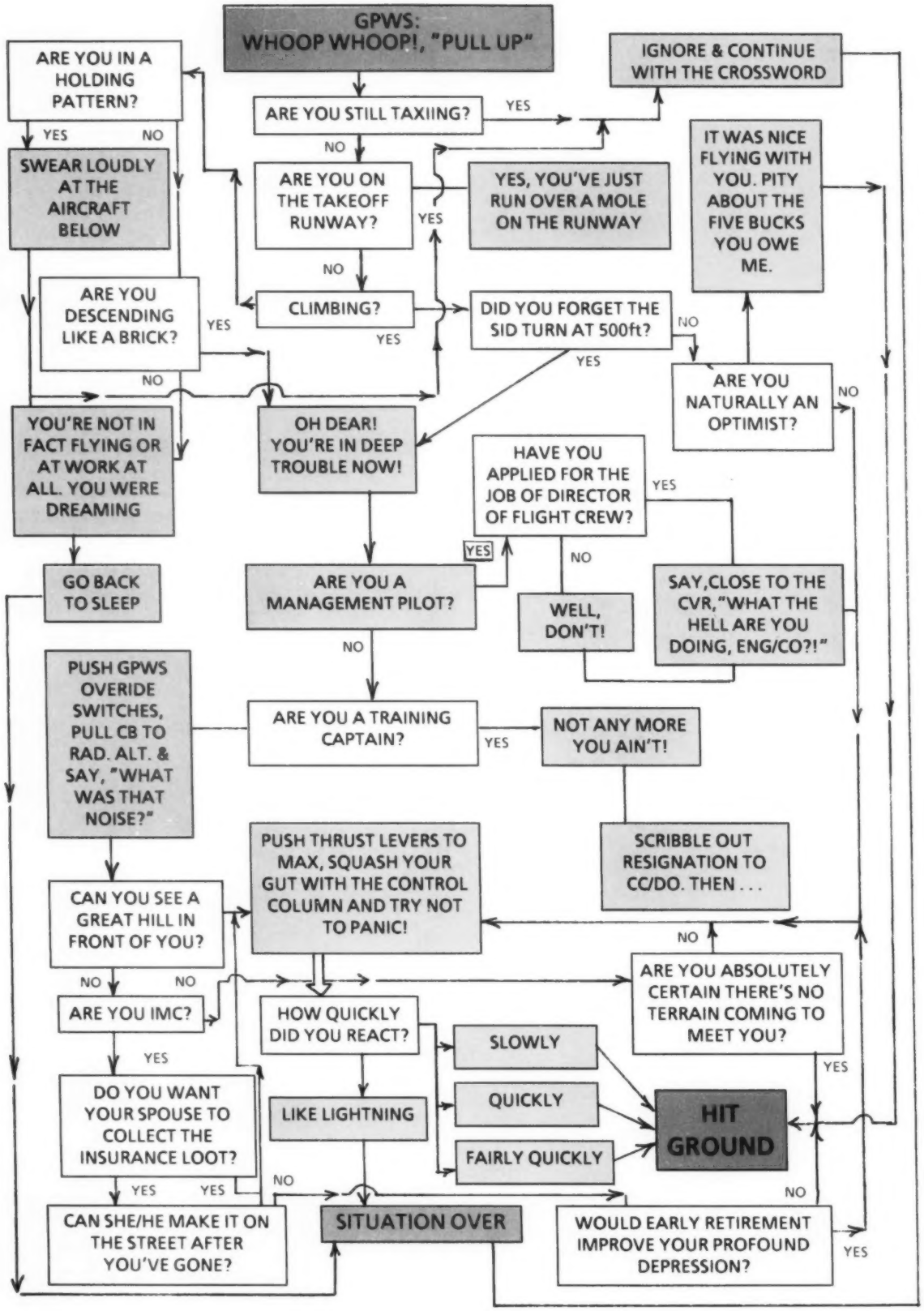
GPWS: WHOOP WHOOP!, "PULL UP"
ARE YOU IN A HOLDING PATTERN?
YES
NO
SWEAR LOUDLY AT THE AIRCRAFT BELOW
ARE YOU STILL TAXIING?
YES
NO
IGNORE & CONTINUE WITH THE CROSSWORD
ARE YOU ON THE TAKEOFF RUNWAY?
YES
YES, YOU'VE JUST RUN OVER A MOLE ON THE RUNWAY
IT WAS NICE FLYING WITH YOU. PITY ABOUT THE FIVE BUCKS YOU OWE ME.
NO
ARE YOU DESCENDING LIKE A BRICK?
YES
CLIMBING?
YES
DID YOU FORGET THE SID TURN AT 500ft?
NO
YES
ARE YOU NATURALLY AN OPTIMIST?
NO
NO
YOU'RE NOT IN FACT FLYING OR AT WORK AT ALL. YOU WERE DREAMING
OH DEAR! YOU'RE IN DEEP TROUBLE NOW!
HAVE YOU APPLIED FOR THE JOB OF DIRECTOR OF FLIGHT CREW?
YES
YES
NO
GO BACK TO SLEEP
ARE YOU A MANAGEMENT PILOT?
WELL, DON'T!
SAY, CLOSE TO THE CVR, "WHAT THE HELL ARE YOU DOING, ENG/CO?!"
NO
PUSH GPWS OVERIDE SWITCHES, PULL CB TO RAD. ALT. & SAY, "WHAT WAS THAT NOISE?"
ARE YOU A TRAINING CAPTAIN?
YES
NOT ANY MORE YOU AIN'T!
SCRIBBLE OUT RESIGNATION TO CC/DO. THEN . . .
PUSH THRUST LEVERS TO MAX, SQUASH YOUR GUT WITH THE CONTROL COLUMN AND TRY NOT TO PANIC!
CAN YOU SEE A GREAT HILL IN FRONT OF YOU?
NO
NO
ARE YOU IMC?
HOW QUICKLY DID YOU REACT?
SLOWLY
QUICKLY
FAIRLY QUICKLY
LIKE LIGHTNING
HIT GROUND
ARE YOU ABSOLUTELY CERTAIN THERE'S NO TERRAIN COMING TO MEET YOU?
YES
NO
YES
DO YOU WANT YOUR SPOUSE TO COLLECT THE INSURANCE LOOT?
YES
YES
NO
CAN SHE/HE MAKE IT ON THE STREET AFTER YOU'VE GONE?
SITUATION OVER
NO
WOULD EARLY RETIREMENT IMPROVE YOUR PROFOUND DEPRESSION?
YES

Adapted from: *SPRINGBOK SAFETY NEWS*